Washington State Department of Transportation

# HMA Mix Design Submittal

## Contract Information

| Contract Number | State Route | Section | Date |
|---|---|---|---|
| | | | |

| Project Engineer | Region |
|---|---|
| | |

| HMA Paving Contractor | Submitted By |
|---|---|
| | |

| HMA Class | ESALs (millions) |
|---|---|
| ☐ 3/8 Inch ☐ 3/4 Inch ☐ ATB<br>☐ 1/2 Inch ☐ 1 Inch ☐ Other (Describe) _____ | |

| Gyration Levels | HMA Evaluation Method |
|---|---|
| N Initial: _____ N Design: _____ N Max: _____ | ☐ Statistical ☐ Non Statistical ☐ Commercial |

## Asphalt Binder Information

| **Primary** Asphalt Binder Supplier | Asphalt Binder Specific Gravity (Gb) | Asphalt Binder Grade |
|---|---|---|
| Mixing Temperature Range | Compaction Temperature Range | Anti-Strip Type |
| **Secondary** Asphalt Binder Supplier | Asphalt Binder Specific Gravity (Gb) | Asphalt Binder Grade |
| Mixing Temperature Range | Compaction Temperature Range | Anti-Strip Type |

## Contractor Aggregate Structure and Aggregate Test Data

In the table below provide the "Material" identification (3/4"-0, Blend Sand, etc.), "Source" (J-199, E-320, etc.), "Ratio" (45%, 20%, etc.), and the percent passing each sieve for each stockpile used in the mix design as well as the combined gradation and the specification requirements for the class of HMA used. Report all stockpile gradations to the nearest tenth of a percent. Report the combined gradation to the nearest whole percent except the U.S. No. 200, which must be reported to the nearest tenth of a percent.

| Material | | | | | | Combined Gradation | Specification Requirements |
|---|---|---|---|---|---|---|---|
| Source | | | | | | | |
| Ratio | | | | | | | |
| 1 1/2” Square | | | | | | | |
| 1” Square | | | | | | | |
| 3/4” Square | | | | | | | |
| 1/2” Square | | | | | | | |
| 3/8” Square | | | | | | | |
| U.S. No. 4 | | | | | | | |
| U.S. No. 8 | | | | | | | |
| U.S. No. 16 | | | | | | | |
| U.S. No. 30 | | | | | | | |
| U.S. No. 50 | | | | | | | |
| U.S. No. 100 | | | | | | | |
| U.S. No. 200 | | | | | | | |

## Contractor's Aggregate Test Data

In the tables below provide all of the aggregate specific gravity and aggregate quality property test data determined for each stockpile and the selected design aggregate structure (Combined Gradation) as required. The specification requirements only apply to the design aggregate structure (Combined Gradation).

### Aggregate Specific Gravity, Sand Equivalency, and Uncompacted Void Content of Fine Aggregate

| Material | | | | | | Combined Gradation | Specification Requirements |
|---|---|---|---|---|---|---|---|
| Source | | | | | | | |
| Ratio | | | | | | | |
| Gsb Coarse | | | | | | | |
| Gsb Fine | | | | | | | |
| Gsb Blend | | | | | | | |
| Sand Equiv. | | | | | | | 45 Min., 35 Min. for ATB |
| Uncompacted Void Content* | | | | | | | 45% Minimum |

### Coarse Aggregate Fracture*

| Sieve Sizes | | | | | | Combined Gradation | # Fractured Faces | Specification Requirements |
|---|---|---|---|---|---|---|---|---|
| 1" Square | | | | | | | | 90% Minimum |
| 3/4" Square | | | | | | | | 90% Minimum |
| 1/2" Square | | | | | | | | 90% Minimum |
| 3/8" Square | | | | | | | | 90% Minimum |
| U.S. No. 4 | | | | | | | | 90% Minimum |

*** Not applicable to Asphalt Treated Base (ATB).**

Remarks

## Contractor's HMA Mix Design Data

In the table below provide the HMA volumetric mix design data determined by performing WSDOT SOP 732. The Va, VMA, VFA, and Gmb values must be determined from replicate mixtures compacted to the appropriate Ndesign gyration level in accordance to section 8.2 of SOP 732, **back calculated values from replicate mixtures compacted to Nmax are not acceptable.**

| | **Primary Asphalt Binder** | | | **Secondary Asphalt Binder** | | |
|---|---|---|---|---|---|---|
| HMA Properties | -0.5% Pb Design | Pb Design | +0.5% Pb Design | -0.5% Pb Design | Pb Design | +0.5% Pb Design |
| Pb | | | | | | |
| % Gmm @ Nini | | | | | | |
| % Gmm @ Ndes (Va) | | | | | | |
| % VMA @ Ndes | | | | | | |
| % VFA @ Ndes | | | | | | |
| Dust / Asphalt Ratio | | | | | | |
| Pbe | | | | | | |
| Gmm | | | | | | |
| Gmb | | | | | | |
| Gse | | | | | | |
| Height @ Nini | | | | | | |
| Height @ Ndes | | | | | | |

## Contractor's HMA Mix Design Proposal(s)

In the table below provide the HMA volumetric mix design data that comes closest to, or intersects,4.0% (7.0% for ATB) Va, from the testing performed via WSDOT SOP 732. This may be the same as the Pb design data from the table above. Also provide the % Gmm data developed from the replicate mixtures compacted to appropriate Nmax gyration level.

| HMA Properties | **Primary Asphalt Binder Proposal** | **Secondary Asphalt Binder Proposal** | Specification Requirements |
|---|---|---|---|
| Pb | | | |
| % Gmm @ Nini | | | |
| % Gmm @ Ndes | | | 96.0 (93.0 for ATB) |
| % VMA @ Ndes | | | |
| % VFA @ Ndes | | | |
| Dust / Asphalt Ratio * | | | 0.6 - 1.6 |
| Pbe | | | |
| Gmm | | | |
| Gmb | | | |
| Gse | | | |
| % Gmm@ Nmax * | | | $\leq$ 98.0 |

*** Not applicable to Asphalt Treated Base (ATB).**

I certify this HMA job-mix formula (JMF) has been developed in accordance to WSDOT Standard Operating Procedure (SOP) 732 "Volumetric Design for Hot-Mix Asphalt (HMA)". The HMA JMF has been verified in accordance to section 10 of SOP 732 which consist of preparing replicate mixtures containing the selected design aggregate structure at each of the following binder contents: (1) the estimated design binder content, Pb (design); (2) 0.5 percent below Pb (design); (3) 0.5 percent above Pb (design). I am aware, in accordance to Standard Specification 5-04.3(7)A subsection 2, that a response will be provided within 25 calendar days after a complete mix design submittal has been received at the State Materials Laboratory in Tumwater.

Signature _____ Title _____ Phone _____ Date _____